## CLAIMS

1. A method of identifying a moving object in a synthetic aperture radar (SAR) image of a region of interest, comprising:

establishing a plurality of receive phase centers for a SAR image collector;

obtaining a SAR image using the plurality of receive phase centers; and

detecting in the SAR image a signature indicative of a moving object in the region of interest, wherein detecting the signature further includes an identification of the presence of the moving object in the SAR image as a function of image collection time.

2. A method according to Claim 1 wherein, the signature comprises a plurality of low intensity points generated through use of the plurality of receive phase centers in the SAR image collector.

3. A method according to Claim 2 wherein the plurality of low intensity image points comprise two categories which include category-1 artifacts and category-2 artifacts, wherein the category-1 artifacts being actual images of movers and the category-2 artifacts being extraneous points;

4. A method according to claim 3 wherein the category-1 artifacts are formed as a combination of a plurality of received pulses all originating from a common transmitted pulse, and the category 2 pulses being formed as a combination of a plurality or received pulses each originating from a different transmitting pulse.

5. A method according to claim 2 wherein each of the low intensity points includes at least one of:

a unique impulse response (IPR) shape, a unique IPR orientation, and azimuthal

aliasing.

6. A method according to Claim 5, wherein the reading step comprises:

determining the unique orientation of a category-1 IPR in the SAR image based on a time-since-collection-start.

7. A method according to Claim 5, wherein the determining step comprises:

computing a range direction of the category-1 artifacts associated with a given time-since-collection-start, and then filtering to retain only those IPRs with the associated range direction, thereby recovering only the category-1 artifacts associated with the given time-since-collection-start.

8. A method according to Claim 5, wherein the reading step includes placing small visible dots in the SAR image at the centers of the category-1 IPRs.

9. A method according to claim 1 wherein said step of detecting comprises transforming the SAR image to a alternative domain which enhances the detection of the signature in the SAR image.

10. A method according to Claim 9, wherein the filtering step further comprises pre-filtering the SAR image using a spatial filter to obtain a pre-filtered image containing only low-intensity images.

11. A method according to Claim 10, wherein the pre-filtering comprising:

identifying a shape model for a low-intensity image, the shape model being based on an impulse response (IPR) form for a low-intensity received pulse;

determining the range direction of a plurality of low-intensity pulses associated with a predetermined time-since-collection start; and

filtering the plurality of low-intensity pulses to retain low-intensity pulses having

the associated range direction.

12. A method according to Claim 1, wherein the detecting step comprises:

generating at least one simulated image of a mover as a template for a matched filter;

generating at least one matched filter; and

applying the matched filter to the SAR image in order to identify a position of the moving object.

13. A method according Claim 12 further comprising the step of generating a plurality of the matched filters, wherein the characteristics of the matched filter provide for identification of at least one of: type of mover, orientation of the mover relative to the collector, and the velocity of the mover.

14. A method according to Claim 13, wherein the reading step includes:

identifying the mover at several known instants in time in order to identify a direction and velocity of the mover.

15. A method according to Claim 1, wherein the reading step includes:

determining linear filtering parameters for separating a signal from noise in the detected synthetic aperture image.

16. A method according to Claim 15, wherein when the separating of the signal is unsuccessful, the reading step further comprises implementing one of pre-whitening filtering and non-linear filtering of the SAR image for separating the signal from the noise.

17. A method according to Claim 1, wherein the reading step comprises determining, for each of a plurality of low-intensity points generated by a moving

scatterer, an IPR shape, an IPR orientation, and an azimuthal aliasing.

18. A method according to Claim 1, further comprising:

transforming the SAR image using a plurality of types of transforms, thereby obtaining a plurality of corresponding transformed image data; and

filtering the transformed image data in order to isolate attributes of the SAR image.

19. A method according to Claim 18, wherein the attributes comprise corruption of an image density distribution.

20. A method according to Claim 18, wherein the attributes comprise an image density distribution for image points that meet at least one threshold intensity level based on a noise level of the SAR image.

21. A method according to Claim 18, further comprising inverse transforming the isolated attributes from the filtering.

22. A method according to Claim 21, further comprising determining the presence of a moving object in the image by determining a corruption type from corruption attributes and associating the corruption type with a particular density pattern.

23. A method according to Claim 22, further comprising combining at least one of: addition and multiplication, inverse transformed attributes to obtain a filtered image.

24. A method according to Claim 2, wherein the reading step comprises determining a density distribution for a portion of the SAR image.

25. A method according to Claim 24, wherein the reading step further comprises determining pattern characteristics of the density distribution.

26. A method according to Claim 25, wherein the determining step comprises comparing the density distribution with a pattern in memory.

27. A method according to claim 24 wherein the density distribution may be further analyzed to identify a type of mover.

28. A method according to claim 27 wherein the analysis may be performed using neural network.

29. The method pf claim 28 wherein the network is trained using characteristic density distributions to identify at least one of:

type, positions, and velocity of a mover.

30. A system for tracking a moving object in a synthetic aperture radar (SAR) image, comprising:

apparatus for generating a SAR image using data collected through use of a plurality of receive phase centers;

filtering apparatus for performing a least one filtering function to enhance detection of at least one image artifact in the SAR image generated as a result of use of the plurality of receive phase centers; and

image analyzing apparatus to analyze the at least one image artifact in the SAR image to identify at least one signature of at least one mover object.

31. A system of Claim 30 wherein the filter apparatus is configured to pre-filter the SAR image using a spatial filter to obtain a pre-filtered image containing only low-intensity images.

32. A system of claim 30 wherein the filter apparatus is further configured to:

identify a shape model for a low-intensity image, the shape model being based on an impulse response (IPR) form for a low-intensity received pulse;

determine a range direction of a plurality of low-intensity pulses associated with a predetermined time-since-collection start; and

filter the plurality of low-intensity pulses to retain low-intensity pulses having the associated range direction.

33. The system of claim 30 wherein the filter apparatus is further configured to identify at least two categories of very-low-intensity points in the SAR image, the categories include: category-1 artifacts and category-2 artifacts, where the category-1 artifacts are actual images of movers and the category-2 artifacts are extraneous points.

34. The system of claim 33 wherein the moving object appears in the SAR image as a sum of its associated category-1 artifacts and category-2 artifacts, the category-1 artifacts being formed using a plurality or received pulses originating from a common transmitted pulse and the category-2 artifacts being formed using a plurality of the received pulses each from a different transmitted pulse.

35. The system of claim 34 wherein the analyzing means are further configured to compute a range direction of the category-1 artifacts associated with a given time-since-collection-start, and then filtering to retain only those IPRs with the associated range direction, thereby recovering only the category-1 artifacts associated with the given time.

36. The system of claim 34 wherein the analyzing apparatus is further configured to determine, for each of a plurality of low-intensity points generated by a moving scatterer, an IPR shape, an IPR orientation, and an azimuthal aliasing.

37. A system according to Claim 30, wherein the filtering apparatus is further configured to transform the SAR image using a plurality of types of transforms, thereby obtaining a plurality of corresponding transformed image data and to further filter the transformed image data in order to isolate attributes of the SAR image.

38. A system according to Claim 37, wherein the attributes comprise an image density distribution for image points that meet at least one threshold intensity level based on a noise level of the SAR image.

39. A system according to Claim 30, wherein data storage device accessible by the image analyzing apparatus which stores at least one known property of a signature of a moving object which may appear in the SAR image.

40. A system according to Claim 39, wherein the memory device stores corruption attributes employable for associating the detected corruption type with a particular density pattern.

41. A system according to Claim 38, wherein the analyzer is configured to determine the density distribution for a portion of the SAR image.

42. A system according to Claim 41, wherein the analyzing apparatus is further configured to determine pattern characteristics of the density distribution.

43. A system according to Claim 42, wherein the analyzing apparatus is further configured to access the memory device and compare the analyzed density distribution with at least one stored pattern in memory.

44. A system according to Claim 43 wherein the at least one stored pattern comprises a matched filter configured with characteristics of a particular type of moving object.

45. A system according to Claim 44 wherein the analyzing apparatus is further configured to access an plurality of the matched filters and sequentially apply the matched filters to the SAR image to identify and of the moving objects.

46. A system according to Claim 30 wherein the analyzing apparatus is configured to employ a neural network in analyzing the SAR image to identify the moving objects.

47. The system of Claims 46 wherein the network is trained using characteristic density distributions to identify at least one of:

type, position, and velocity of the moving object.

48. A method of enhancing information obtained from a synthetic aperture image, comprising:

characterizing a selected part of the synthetic aperture image to obtain a unique signature of a low-intensity scatterer, the synthetic aperture image being obtained using multiple phase centers; and

enhancing information based on the signature.

49. A method as claimed in Claim 46, wherein the enhancing of the information is a function of an image collection time for the synthetic aperture image.